



APPRAISAL OF INSTRUCTIONAL RESOURCE UTILIZATION IN TEACHING AND LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN ENUGU NORTH LOCAL GOVERNMENT AREA OF ENUGU STATE.

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ABSTRACT

The relative decline in the academic achievement of students in Biology in Senior Secondary Schools has necessitated this study. Thus, the study sought to find out the appraisal of instructional resource utilization for teaching and learning of Biology in Senior Secondary Schools in Enugu North L.G.A. of Enugu State. Three research questions and three hypotheses guided the study. The researcher adopted descriptive survey research design. The population of the study was made up of thirty- one (31) Biology teachers in Enugu North L.G.A. No sampling was carried out as the population size was manageable. The instrument used for data collection was a structured questionnaire. Cronbach alpha Statistic was employed in determining the internal consistency of AIRUTLBSSS.in which the overall reliability coefficient index of 0.873 was obtained. The data obtained were analyzed using mean and standard deviation for answering the research questions, and t-test statistic for testing the null hypotheses. The study arrived at the following findings: Biology teachers use the available resource teaching materials in teaching and learning of biology to a high extent. Biology teachers had positive attitude towards utilization of instructional materials in teaching of biology. There are impediments to utilizing instructional resources for teaching and learning biology in senior secondary schools. The hypotheses showed that there was no significant difference in the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of Biology and their attitude towards utilization of instructional materials. The hypothesis also showed no significant difference in the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of Biology. Based on the findings, the researchers recommended that teachers should be encouraged to the method of use of instructional materials in teaching and learning of biology in senior secondary schools.

Keywords: Appraisal, Instructional Resources, Teaching, Learning and Biology.



INTRODUCTION

Biology is one of the science subjects offered in the secondary schools. It deals with the study of living things such as plants and animals. According to Umar (2011), Biology is a natural science that deals with living world: how the world is structured, how it functions and what these functions are, how it develops, how living things came into existence, and how they react to one another and with their environment. It is a fascinating study that ranges from microscopic-cellular molecules to the biosphere, encompassing the earth's surface and its living organisms (Sarigin, 2011). Biology is a pre-requisite to the study of many courses relevant to humanity which includes the following; Medicine, Pharmacy, Biochemistry, Agriculture, Anatomy, Physiology, Botany, Zoology, Microbiology, Cell Biology, Ecology, Entomology Immunology, Molecular biology and among others. It is an important subject that should be taught meaningfully by creating awareness in the minds of the learners hence the use of instructional materials or concrete materials should be used to enhance effective learning.

The importance of Biology in the economic, industrial and public life of the learner and humanity cannot be overstressed. The National Policy on Education (2013) stated the objectives of learning biology to be that it will provide the students with the following;

Suitable laboratory and field skills in biology

Meaningful and relevant knowledge in Biology

Scientific knowledge that is applicable in health, agriculture, personal and community daily life matters and among others.

The importance of biology is so much that it needs to be taught with instructional resources to arouse students' interest.

Instructional materials are resources that aid teaching and learning. It helps to raise learning from verbalization to practical aspect of teaching and learning. It stimulates students desire to learn, and assist the learning process by making assimilation and memorization easy, (Kay, Naselaris, Prenger and Gallant, 2014). An instructional material makes students understand more easily. It makes the teacher's task easier and more effective. It plays a very important role in the teaching and learning process, enhances the memory level of the students and as well enhances the learning achievement. It brings clarity and creates recognition that allows a total knowledge of the subject. It enhanced learning, improves the competence of learners and makes learning more meaningful to students (Anyanwu and Alafiatayo, 2015). Consequently, different instructional materials are used for different concepts in Biology. Yero, (2011) mentioned four types of instructional aides or materials, which include the following:

- i. Visual Aids: - These are instructional materials that make visual impression – that is, it interprets the vision of the eyes. They include chalk board, posters, models, motion pictures, projected transparencies.
- ii. Auditory Aids: - These appeal to the sense of hearing and include record players, tape recorders and language laboratories.



- iii. Audio – visual Aids: - These involve both hearing and visual senses e.g. based on sound and vision. Advancement in modern technology has led to the production of devices known as Information Communication Technology (ICT), which is also used in teaching.
- iv. Stimulation Devices: - These include devices built to stimulate the actions and functions of real thing or object like models.

Instructional materials according to Oriade (2011) have the characteristics of holding attention of almost all the students because they reinforce verbal messages by providing a multi-media approach. The importance of instructional materials according to Oriade (2011) emphasized that no matter how good a curriculum may be, absence of the use of instructional materials can jeopardize its effective implementation. An instructional material makes learning available to a wider audience, controls the pace of learning, promotes better understanding and helps to overcome physical difficulties in presenting the subject content. An instructional material stimulates student's participation in class, increases knowledge and affects the achievement of biology students. Instructional materials are seen as an improvement and great relief for teachers in impacting knowledge and making the message clearer, more interesting and easier for the learners to assimilate (Onasanga and Adegbiya 2014).

For teaching and learning of biology to be effective, it requires both human and material resources (non-human materials). Human resources such as teachers and laboratory attendants take active role in the implementation of the curriculum. The human resources also include a qualified science and biology teacher, laboratory technologist, laboratory attendant and amongst others. The science or biology teachers are the ones who will deliver the science and biology content to the students while the laboratory technologist and the attendant are to assist him in making and preparing the laboratory and materials where the lesson is to take place. The effective utilization of human resources will help in the effective delivery of biology lessons. The material resources in the teaching and learning of biology include all the materials that are needed for the effective teaching and learning of biology. These resources include the following microscope, meter rule, stop watch, math set, hand lens, preserved specimen, Dissecting kits, petridish, gas cylinder, Aquarium, school building (Laboratory), test tube, biological charts, beakers, school garden, models, measuring cylinders, filter funnel, hygrometer, wind vane, wash bottle, quadrat, reagent, live specimen, weighing balance, rain gauge, thermometer, computer, charts, photographs, anemometer, Bunsen burner and barometer etc. It is because of the importance of instructional materials, that leads to the need for their utilization in teaching and learning process.

Resource utilization is the term coined for the process of managing and organizing instructional materials/resources. The utilization of resources in teaching brings about meaningful learning, since it stimulates students' sense and serves as a motivator. A study on science games in National Curriculum in the United Kingdom reported that games when



used as a resource enable less able children to stay on task and remains motivated for longer period. Jekayinfa (2012) identified the importance of utilization of instructional materials as making learning concrete and real. The resource utilization helps to make learning interesting, leading to greater perception, understanding and retention of the subject matter. There are resources that the science teacher can readily use to enrich the learning process. These include microscope, vivarium, herbarium, aquarium, plant press, culturing equipment, wind vane, rain-gauge, metre rule, models and charts (Olagunju, 2011). According to Umeoduagu, (2013) the resources should be provided in quality and quantity in Science Technology and Mathematics (STM) classroom for effective teaching-learning process. Since utilization of instructional materials plays a greater role in the understanding of the subject, there is need for better teaching strategy to ensure that materials are properly utilized.

Teaching according to IGI Global, (2019), is the concerted sharing of knowledge and experience, which is usually organized within a discipline and, more generally, the provision of stimulus to the psychological and intellectual growth of a person by another person or artifact. According to Ibeneme (2012), teachers' method of the use of instructional materials for teaching and learning of biology promotes teachers' efficiency and improves students' performance. They make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students to participate actively and effectively in lesson sessions. They give room for acquisition of skills and knowledge and development of self- confidence and self- actualization. Another strategy involve in teaching biology is making use of equipment in the laboratory. A Laboratory is a room or a forum where science teachers and their students interact. The laboratory varies in dimension and equipment as a result of the funds available. As a science subject, biology tends to solve human problems and answer some guesses and hypotheses. Some of the features science is testing and experimenting are conveniently carried out in a laboratory (Enohuean, 2015). A well planned laboratory should be located away from the classroom, busy roads, hostels, dining rooms, game field and lucrative or relaxation centre. This is because the materials and equipment placed could be hazardous to health. Some laboratory activities require maximum concentration and as such need a quiet environment such as preparation of chemicals and testing of foods. In designing a biology laboratory the number of students that should be accommodated, the fund and materials required are put into consideration to avoid shortage and non-availability of resource. Tabotndip (2014) lamented that abstract teaching goes on today where teachers do not use apparatus and students are not using textbooks. It is reported that most secondary schools do not have biology laboratory, the few existing ones have been converted into classrooms to create space for the overwhelming population of students arising from the Universal Basic Education (UBE)



and Universal Primary Education (UPE). As a result of WAEC specification on SSCE examination, some schools resort to multipurpose laboratory. This ought not to be so for they have their disadvantages such as fire or chemical outbreak or accidents. There is need for a single laboratory for each of physics, chemistry as well as biology practical. In case of biology, the charts, specimen and models may not be displayed for recognition and observation. Learning occurs when all the facilities for study are harnessed for work during a teaching and learning experience (Tabotndip 2014).

Thus, this inadequacy of teaching material resources, laboratory equipment /reagents / chemical, and laboratory space, has been of serious concern to educators and have affected the academic achievement of biology students in WAEC. According to the West African Examination Council (WAEC) Chief examiner's report (2013-2018), there has been persistent poor achievement of students in biology at Senior Schools Certificate Examination (SSCE). This persistent poor achievement of students leaves one in doubt about the effectiveness of instructional materials approaches used by the biology teachers for the teaching and learning of biology. According to Ogbu, (2016), there are some impediments that may hinder the effective utilization of resources in teaching and learning.

Hornby (2015) defined impediment as obstruction, obstacle or hindrance that delays or stops progress of something, an art or an action. Impediment is therefore any force or phenomenon that lowers, reduces or puts to an end the expected pace of any event or activity. Impediment could equally be occasioned by prevailing situation circumstance, or even personal disposition and potentials which the actor or actors find themselves. For example, if a biology or science teacher has an inherently poor intellectual disposition, his resourcefulness and ability to utilize instructional material may be grossly hindered. According to Ogbu (2016), impediments to effective utilization of instructional materials for teaching and learning biology and science subjects include: teachers lack of creativity, lack of teacher's zeal to make use of instructional material, most of the teachers are not resourceful enough to undertake instructional materials; epileptic electric power supply and lack of alternative energy sources for laboratories; most teachers not knowing how to manipulate some of the equipment; Some of the specimens for biology practical are not available; Lack of fund for purchasing the equipment and materials for Biology ; Laboratory assistants and technologists not helping the teachers in organizing and conducting practical and available materials at times not accessible to the teachers.

Thus, the availability and resource utilization alone does not guarantee the achievement of teaching and learning objectives but right choice of the materials, timely and proper presentation of the material (Patel & Mukwa, 2013). Resources utilization have their own challenges considering high costs of the resources, choice and technical knowhow in the use of some technical resources like some computer packages. Mwangi (2015) advocates that there is a wide range of biology resources that can be used in teaching and learning and are classified according to usage, learning potency and level of sophistication and these instructional materials/resources has improved performance of



students in examinations. Ogbu, also sees teachers' attitude as an impediments to effective utilization of resources in teaching and learning.

Attitude is an important concept to understand human behaviour. It is defined as a complex mental state. Dodeen (2013) defines attitude as tendency to react in a certain way towards a designed class of stimuli. People's attitudes towards their profession have an effect on their performance. This case is also valid for the profession of teaching. Dodeen (2013) found that female teachers have more positive attitude towards utilization of instructional resources than male teachers. The attitude and expectation of society in general and of the family of the learner in particular affect how learning is viewed and how teaching is organized. These attitudes and expectations vary from society to society and attempting to copy learning and teaching strategy from one society into another, without trying to adapt into the local conditions may not be successful (Derebssa 2016). Studies have pointed out that teacher's negative personal and professional behaviour and poor social image of the teacher and teaching profession are serious factors responsible for teacher's low status. There has been a general agreement that the attitude of teachers towards utilization of instructional materials is significantly correlated with teaching success. In general, it may be concluded that there are indications that teacher's attitudes towards utilization of instructional materials have a positive relation with success in teaching. Researchers identified many factors and situations that influence the development of attitudes such as: type of schooling, the parental attitudes, and the attitude of friends, teachers, and siblings.

Lack of utilization of instructional materials, poor teaching strategy, poor equipped laboratory and negative attitude of teachers towards utilization of instructional materials contribute to decline in the academic achievement of students in Biology.

The decline in performance in science subjects especially in biology subject in senior secondary schools may be connected with poor learning environment created by the poor utilization of instructional facilities. Enhanced utilization of these facilities promotes effective teaching and learning activities in schools while their un-utilization affects the academic performance negatively, especially in Biology.

It is perceived that one of the main problems facing most secondary schools in Enugu North Local Government Area today is the relative decline in the academic achievements of the students especially in Biology. The secondary schools in other local government areas in Enugu State are no exception. The academic achievements of students in biology have been on the decline and therefore not being able to reach the desired goal. The poor achievements in biology could be attributed to some factors such as: lack of use of instructional material and poor teaching method. Other factors that contribute to poor achievement in biology include: lack of facility for imparting knowledge, inadequate equipment in laboratories where they exist, lack of teacher's zeal to make use of instructional materials or improvise in the absence of standard materials, lack of students' exposure to practical lessons and insufficient time for practical activities, lack of interest in creativity on the part of teachers and poor teaching strategies, large size of the classes



leading to inadequate or poor management of classes and unqualified or inexperienced teachers handling biology classes. Available literature shows that much of biology teaching is carried out through chalk and board mode of instruction delivery with little or no emphasis on the use of instructional materials. This study therefore seeks to find out the instructional resources utilized in teaching and learning of biology in senior secondary schools.

PURPOSE OF THE STUDY

The main purpose of the study is to appraise the instructional resources utilized in teaching and learning of biology in senior secondary schools in Enugu North Local Government Area of Enugu State. Specifically, the study is aimed to;

1. find out the extent teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools.
2. ascertain the attitude of biology teachers towards utilization of instructional materials in teaching and learning of biology in senior secondary schools.
3. determine the impediments to utilizing instructional resources in teaching and learning biology in senior secondary schools.

RESEARCH QUESTIONS

The following research questions were raised to guide the study;

1. To what extent do teachers use the available resource teaching materials in teaching and learning of biology in senior secondary schools?
2. What is the attitude of biology teachers towards utilization of instructional resource materials in teaching and learning of biology in senior secondary schools?
3. What are the impediments to utilizing instructional resources in teaching and learning Biology in senior secondary schools?

HYPOTHESES

The following hypotheses were tested at 0.05 level of significance

- H₀₁: There is no significant difference between the mean responses of male and female biology teachers on the extent to which teachers utilize the available resource teaching materials in teaching and learning of biology.
- H₀₂: There is no significant difference between the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials in the teaching and learning biology.
- H₀₃: There is no significant difference between the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of biology.



METHOD

The researcher adopted descriptive survey research design for the study. The design was considered suitable since the study will solicit information from teachers in public secondary schools. The population of the study consists of all the 31 senior secondary school biology teachers in the nine (9) public secondary schools in the study area. Sampling was not carried out because the population size is small and manageable. A 33-itemed questionnaire instrument (AIRUTLBSSS) was used for data collection. The questionnaire was divided in two sections: A and B. Section A was concerned with the respondents' bio-data, while section B was divided into three clusters each dealing with an aspect of the research. Cluster 1 is on teacher utilization with 15 items. Cluster 2 is on teachers' attitude with 6 items. Cluster 3 is on impediments with 12 items. The response format for the instrument (AIRUTLBSSS) is a 4- point scale of Very High Extent (VHE) =4 points: High Extent (HE) =3 points: Low Extent (LE)=2points. Very Low Extent(VLE)=1 point for cluster 1, while cluster 2 has a 4 point scale of Strongly Agree (SA)=4 points: Agree (A) =3 points: Disagree (D)=2points. Strongly Disagree (SD) =1. The instrument(AIRUTLBSSS) made up of 33-itemed questionnaire was validated by three experts, two from the Department of Science Education and one other expert from the field of Measurement and Evaluation, all from the faculty of education, Enugu State University of Science and Technology.

Cronbach's alpha was employed in determining the internal consistency of the AIRUTLBSSS. The researcher administered 30 copies of the questionnaire to 10 biology teachers in secondary schools in Enugu East LGA. Enugu East was chosen because it operates almost the same administrative system as Enugu North LGA. The responses were collected and Cronbach's alpha statistic was employed for the analysis. The reliability coefficient for each cluster of the instrument obtained was .86, .72, and .68, respectively while, the overall reliability coefficient for the entire instrument stood at .87. This value and the values of each cluster of the instrument were considered high enough and indicated that the instrument was reliable.

The researcher administered the instrument directly to the 31 respondents using two research assistants. The research assistants were briefed by the researcher on the conduct of the exercise, during which they were acquainted with the purpose of the study and how the questionnaire should be administered and collected. Appointments were booked with the respondents for collection at a later day for those who were not able to fill their own copies of the instrument because of the nature of their job. The researcher and the research assistants were able to retrieve all the 31 copies of the distributed questionnaire instrument, signifying 100% return rate. The data collected were analyzed using mean with standard deviation in order to answer the research questions. The null hypotheses were tested using t-test statistic at.05 alpha level of significance. For the decision rule, all the items with mean score of 2.50 and more were accepted while those with mean score below 2.50 were rejected. For the hypotheses, if the t-calculated value at



.05 level of significance is less than critical value of the, the null hypotheses were not rejected, but if otherwise the null hypotheses were rejected.

RESULTS

Research Question One: To what extent do teachers use the available resource teaching materials in teaching and learning of biology in senior secondary schools?

Table 1: Analysis of male and female teachers' responses on extent do teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools.

S/N	Extent to which teachers use the available resource teaching materials in teaching and learning of biology include:	Female = 28		Male = 3		Overall = 31		
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	Decision
1	using the microscope for teaching Biology	2.14	1.11	1.67	0.58	1.90	0.85	LE
2	using magnifying glasses for teaching Biology	2.32	0.90	2.33	0.58	2.33	0.74	LE
3	using the hand lens for teaching biology	2.46	1.23	3.33	1.15	2.90	1.19	HE
4	using preserved specimens for teaching biology	3.50	0.58	3.00	1.73	3.25	1.15	HE
5	using models for teaching biology	3.18	0.86	4.00	0.00	3.59	0.43	HE
6	using the food test reagents in the laboratory for teaching biology	3.96	0.19	3.67	0.58	3.82	0.38	HE
7	using the measuring cylinders for teaching biology	2.89	0.99	3.00	1.00	2.95	1.00	HE
8	making use of the wall charts for teaching biology	2.21	0.96	3.00	1.00	2.61	0.98	HE
9	using computer for teaching biology	2.00	0.61	2.33	1.53	2.17	1.07	LE
10	teachers make use of pictures for teaching biology	3.64	0.78	3.67	0.58	3.65	0.68	HE
11	using interactive white board for teaching biology	2.39	0.57	2.00	1.00	2.20	0.78	LE
12	using bunsen burner for teaching biology	3.36	0.78	3.00	1.00	3.18	0.89	HE



13	using beakers for teaching biology	3.50	0.75	3.33	1.15	3.42	0.95	HE
14	using test tubes for teaching biology	3.25	0.89	2.67	1.15	2.96	1.02	HE
15	using test tube holder for teaching biology	3.64	0.68	3.00	1.73	3.32	1.21	HE
Grand Mean		2.96	0.79	2.93	0.98	2.95	0.89	HE

Data in table 1 shows the mean response score of male and female teachers on the 15 items of the questionnaire which is research question one. From the table, all the items have mean scores that is above 2.50 set for the study except items 1, 2, 9 and 11 which had mean scores of 1.90, 2.33, 2.17 and 2.20 respectively. These show that the respondents disagree that biology teachers use the microscope, magnifying glasses, computer and interactive white board for teaching biology. However, the grand mean score for the male and female teachers are 2.93 and 2.96 respectively. The overall grand mean of 2.95 shows that to high extent biology teachers uses the available resource teaching materials in teaching and learning of biology.

Research Question Two: What is the attitude of biology teachers towards utilization of instructional resource materials for the teaching and learning of biology in senior secondary schools?

Table 2: Analysis of male and female teachers' responses on attitude of biology teachers towards utilization of instructional resource materials for the teaching and learning of biology in senior secondary schools.

S/N	Biology teachers attitude towards utilization of instructional materials include:	Female = 28		Male = 3		Overall = 31		Decision
		<u>X</u>	SD	<u>X</u>	SD	<u>X</u>	SD	
16	utilizing instructional materials/ resources for teaching biology	3.36	0.91	2.67	0.58	3.01	0.74	Agreed
17	improvising instructional materials for teaching and learning of Biology	3.07	1.09	3.33	1.15	3.20	1.12	Agreed
18	the believe that utilization of instructional material can improve students' learning of biology	3.29	0.76	2.67	1.15	2.98	0.96	Agreed



19	encouraging students to improvise instructional materials for teaching and learning of biology	3.18	0.90	3.33	0.58	3.26	0.74	Agreed
20	teachers believe that instructional resources expose students to practical experiences	2.79	1.13	3.33	1.15	3.06	1.14	Agreed
21	believe that instructional materials make the presentation of the learning experiences easier for them.	3.36	0.99	3.33	0.58	3.35	0.78	Agreed
Grand Mean		3.17	0.96	3.11	0.87	3.14	0.92	Agreed

Data in table 2 shows the mean response score of male and female teachers on the six items of the questionnaire which answered research question two. From the table all the items had mean score above 2.50 for the study for both male and female teachers. The overall grand mean is 3.14 shows that Biology teachers had positive attitude towards utilization of instructional materials in teaching of biology.

Research Question Three: What are the impediments to utilizing instructional resources in teaching and learning biology in senior secondary schools?

Table Analysis of male and female teachers' responses on the impediments to utilizing instructional resources in teaching and learning biology in senior secondary schools

S/N	Impediments to utilizing instructional resources for teaching and learning biology in senior secondary schools include;	Female = 28		Male = 3		Overall = 31		Decision
		<u>X</u>	SD	<u>X</u>	SD	<u>X</u>	SD	
22	inadequacy of instructional resources for teaching biology	3.46	0.74	3.33	1.15	3.40	0.95	Agreed
23	difficulty in using instructional materials	3.18	0.86	3.33	1.15	3.26	1.01	Agreed
24	available materials at times are not accessible to the teachers	2.57	1.07	2.67	1.53	2.62	1.30	Agreed
25	some instructional materials are not in good working condition	2.79	1.07	3.00	1.00	2.89	1.03	Agreed
26	lack of laboratory technologists	2.36	1.06	1.33	0.58	1.85	0.82	Disagreed



27	utilization of instructional materials for teaching of biology leads to inability to cover the syllabus	2.39	1.03	2.33	0.58	2.36	0.80	Disagreed
28	some instructional materials are old	3.32	0.90	2.67	1.53	2.99	1.22	Agreed
29	poor handling of instructional materials by the students	3.29	0.81	3.33	0.58	3.31	0.69	Agreed
30	students face problems while observing biological specimens especially where they are required to compare them	2.39	0.92	1.67	0.58	2.03	0.75	Disagreed
31	lack of fund to acquire the instructional materials	3.14	0.76	3.33	0.58	3.24	0.67	Agreed
32	some instructional materials cannot be easily improvised	3.07	0.72	3.33	1.15	3.20	0.94	Agreed
33	theft of instructional resources	3.29	0.81	2.67	1.15	2.98	0.98	Agreed
	Grand mean	2.94	0.90	2.75	0.96	2.84	0.93	Agreed

Data in table 3 shows the mean response score of male and female teachers on the twelve items of the questionnaire that answers research question three. From the table, all the items had overall mean score above 2.50 except item 26, 27 and 30 which had mean score of 1.85, 2.36 and 2.03 respectively. This shows that lack of laboratory technologists, utilization of instructional materials for teaching of biology lead to inability to cover the syllabus and problems students face while observing biological specimens especially where they are required to compare them do not serve as impediments to utilizing instructional resources for teaching and learning biology in senior secondary schools. However, the impediments to utilizing instructional resources for teaching and learning biology in senior secondary schools in Enugu North L.G.A includes; inadequacy of instructional resources for teaching biology, difficulty in using instructional materials, available materials at times not accessible to the teachers, some instructional materials are not in good working condition, some instructional materials are old/obsolete, poor handling of instructional materials by the students, lack of fund to acquire the instructional materials, some instructional materials cannot be easily improvised and theft of instructional resources.

Hypothesis One: There is no significant difference in the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools.



Table 4: t-test on the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools in Enugu North L.G.A.

Group	N	Mean	SD	t	df	Sig	Decision
Male	3	2.93	.667	0.218	29	.829	NS
Female	28	2.96	.241				

Table five shows that the t-calculated value on the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools in Enugu North L.G.A is 0.218, not significant at 0.829 level of significance, which is greater than 0.05 level of significance set for the study and therefore the null hypothesis is not rejected. This means that there is no significant difference in the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools.

Hypothesis Two: There is no significant difference in the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials for the teaching and learning biology in senior secondary schools.

Table 5: t-test on the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials for the teaching and learning biology in senior secondary schools.

Group	N	Mean	SD	t	df	Sig	Decision
Male	3	3.11	.419	0.264	29	.794	NS
Female	28	3.17	.381				

Table six shows that the t-calculated value on the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials for the teaching and learning biology in senior secondary schools is 0.264, not significant at 0.794 level of significance, which is greater than 0.05 level of significance set for the study and therefore the null hypothesis is not rejected. This means that there is no significant difference in the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials for the teaching and learning biology in senior secondary schools.



Hypothesis Three: There is no significant difference in the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of biology in senior secondary schools.

Table 6: t-test on the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of biology in senior secondary schools in Enugu North L.G.A

Group	N	Mean	SD	t	df	Sig	Decision
Male	186	2.9200	.381	-1.099	498	.272	NS
Female	314	2.9600	.362				

Table 7 shows that the t-calculated value on the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of biology in senior secondary schools in Enugu North L.G.A is -1.099 which is not significant at 0.272 level of significance, which is greater than 0.05 level of significance set for the study and therefore the null hypothesis is not rejected. This means that there is no significant difference in the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of biology in senior secondary schools.

SUMMARY OF RESULTS

The result of data analysis has shown that:

1. Biology teachers to a high extent utilize the available resource teaching materials in teaching and learning of biology.
2. Biology teachers had positive attitude to a high extent towards utilization of instructional materials in teaching of biology
3. The impediments to utilizing instructional resources for teaching and learning biology in senior secondary schools includes; inadequacy of instructional resources for teaching biology, difficulty in using instructional materials, available materials at times not accessible to the teachers, some instructional materials are not in good working condition, some instructional materials are old and outdated, poor handling of instructional materials by the students, lack of fund to acquire the instructional materials, some instructional materials cannot be easily improvised and theft of instructional resources
4. There is no significant difference in the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools.



5. There is no significant difference in the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials for the teaching and learning biology in senior secondary schools.
6. There is no significant difference in the mean responses of male and female teachers on the impediments to the utilization of instructional materials in teaching and learning of biology in senior secondary schools.

DISCUSSION OF RESULTS

In respect to research question one, there is to a high extent of utilization of available resource teaching materials by biology teachers in Enugu North L.G.A in teaching and learning of biology. This indicates that biology teachers know the importance of utilization of instructional materials for they make learning appear real and concrete. The above result is in affirmation with Jekayinfa (2012) who identified the importance of utilization of instructional materials as making learning concrete and real.

For hypotheses one, the findings presented in the table shows that there is no significant difference in the mean responses of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools. Hence, the null hypothesis is not rejected.

In view of the above, the researcher is of the opinion that since there is to a high extent of the utilization of the instructional materials by the teachers, all and sundry should endeavour to ensure that the materials are always available for their positive impact on the students.

With regards to research question two, biology teachers in Enugu North L.G.A had positive attitude towards utilization of instructional materials in teaching of biology. This finding strongly agrees with the work of Dodeen et al. (2013) who found out that biology teachers have positive attitude towards utilization of instructional resources. There has been a general agreement that the attitude of teachers towards utilization of instructional materials is significantly correlated with teaching success.

For hypothesis two, the findings presented on the table shows that there is no significant difference in the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials for the teaching and learning biology in senior secondary schools. Hence, the null hypothesis is not rejected.

In view of the researcher's opinion, since there is positive attitude by the teachers, it indicates that teachers' attitudes towards utilization of instructional materials have a positive relation with success in teaching

In research question three, there are impediments to utilizing instructional resources for teaching and learning biology in senior secondary schools. This finding concurs with extant literature of Ogbu (2016), there are impediments to effective utilization of instructional materials for teaching and learning biology and science subjects such as: teachers' lack of creativity, most of the teachers are not resourceful enough to undertake instructional materials; epileptic electric power supply and lack of alternative energy



sources for laboratories; most teachers not knowing how to manipulate some of the equipment; Some of the specimens for biology practical not been available; Lack of fund for purchasing the equipment and materials for Biology.

In view of the researcher's opinion, these impediments have to be looked into to avoid negative effects on the students' academic achievement especially in their external exams such as WAEC and JAMB. Provisions should be made in providing those ones that are not available, training of teachers on how to use the available ones and provision of constant electric power supply for those resources that require electricity.

CONCLUSION

From the results of the study, the following conclusions were drawn.

To high extent biology teachers use the available resource teaching materials in teaching and learning of biology. This means that the available resources such as preserved specimens, models, food test reagents, measuring cylinders, wall charts are highly utilized by biology teachers and that made the response mean score of both male and female biology teachers to be above 2.5. There is no significance difference in the mean response of male and female biology teachers on the extent to which teachers use the available resource teaching materials for teaching and learning of biology in senior secondary schools. More so, there is positive attitude of biology teachers towards utilization of instructional materials in teaching and learning of biology. This positive attitude is as a result of them believing that instructional materials expose students to practical experiences. The study also found out that there is no significant difference in the mean responses of male and female biology teachers in their attitude towards utilization of instructional materials. The study also found that there are some impediments to utilization of instructional resources in teaching and learning of biology in senior secondary schools especially in the schools that experience shortage of funds in the procurement of those instructional resources and that there is no significant difference in the mean responses of male and female teachers on the impediments in utilization of instructional materials in teaching and learning of biology in senior secondary schools.

EDUCATIONAL IMPLICATIONS

The result of this research shows that to a high extent, biology teachers utilize instructional resources in teaching and learning of biology in senior secondary schools. This makes teaching and learning easier for both teachers and students. Therefore, teachers should be abiding by the rule of use of instructional resources in their teaching and learning process.

The positive attitude of biology teachers towards utilization of instructional resources is an indication that instructional resources is been given a rightful place in teaching and learning of biology, thus indicating a hope for an improved academic performance of the students at both internal and external examinations.

The impediments to the utilization of instructional resources in teaching and learning of biology holds a serious implication to the teaching and learning of biology thus



if adequate measures are not put in place to ameliorate these impediment, the status and standard of teaching and learning of biology may be at decline. More so, a continued existence of these impediments pose great threat to the academic achievement of the students. Thus, it will imply high rate of failure and hatred of the subject by the students.

RECOMMENDATIONS

In the light of the findings of the study, the following recommendations were made:

1. The use of instructional materials enhance students' interest in biology, teachers should be encouraged to adapt the method of using instructional materials in teaching and learning of biology in senior secondary schools.
2. State and federal government should sponsor the provision of expensive instructional resources in teaching and learning of biology.
3. Frequent training, and re-training, workshop, seminars and conferences should be organized for the teachers on utilization of some instructional resources to enable them impact the knowledge to their students.

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